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18 January 2019

Melanie Morash
Remedial Project Manager
U.S. Environmental Protection Agency
Region 9
75 Hawthorne Street (SFD-7-1)
San Francisco, CA 94105

RE: Response to Additional EPA Comments Received on 21 December 2018 Regarding the Annual Groundwater Monitoring Report 811 East Arques Avenue Site, Sunnyvale, California

Dear Ms. Morash:

This letter is submitted on behalf of Philips Semiconductors Inc (Philips) in response to the additional comments received via email on 21 December 2018. EPA's additional comments were prepared in response to Locus' original response to comments letter delivered on 10 December 2018. Comments pertain to the Annual Report for the 811 East Arques Avenue Site in Sunnyvale, CA. EPA comments are restated in *italics*; responses to comments follow.

1. New Comment: *We suggest consolidating the 2018 Report for the Signetics Site with the planned 2018 groundwater monitoring report for the Offsite OU.*

Response: Philips has reviewed the RWQCB order and agrees that a single report will continue to be in compliance with the requirements of the order. Beginning with the 2018 Annual Report, Annual Reports for the OOU and Signetics sites will be combined into a single report. Philips would like to request that EPA maintains the separation of oversight tracking and allocates the portions appropriately to either Signetics or OOU.

2. Original Sept. 19, 2018 EPA Comment: *In accordance with the Order, reporting shall include identification of potential problems that will, or may, cause noncompliance with the Order. Accordingly, hydraulic capture of the contaminant plumes for the hydrostratigraphic units (HSUs) does not appear to be sufficiently demonstrated. Please revise the Report to discuss and address this issue. Evaluation of the capture zones should be in accordance with EPA's guidelines (2008).*

Locus Response - Capture zones will be evaluated and mapped annually, beginning with the 2018 Annual Report. Plume capture will be discussed accordingly in the report text.

EPA Response - Comment acceptable with the provision that the 2018 Annual Report follows the 2008 EPA guidelines for the evaluation of capture zone. EPA expects that the plume will be evaluated in accordance with the 6-step process outlined in the guidance that includes the following elements:

Step 1: Review site data, site conceptual model (updated), and remedy objectives.
Step 2: Define specific Target Capture Zone.
Step 3: Interpret water levels
- *Potentiometric surface maps (horizontal) and water level difference maps (vertical)*
- *Water level pairs (gradient control points)*

Step 4: Perform calculations
- *Estimate flow rate calculation*
- *Capture zone width calculation (can include drawdown calculations)*
- *Modeling (analytical or numerical) to simulate water levels, in conjunction with particle tracking and/or transport modeling)*

Step 5: Evaluate concentration trends
Step 6: Interpret actual capture based upon Steps 1-5, compare to target Capture Zone, assess uncertainties and data gaps.

Protocols used in the evaluation of each of these steps are well defined in the EPA guidance (EPA, 2008). The extension for submission of the 2018 Annual Report to April 30, 2019 will allow additional time to address the effort necessary for plume evaluation using EPA's systematic approach.

Response: Protocols for the capture zone evaluation (Steps 1-6 in the EPA guidance cited) will be used for the capture zone evaluation beginning with the 2018 Annual Report. Philips also confirms that the combined site Annual reports will be submitted to EPA by 30 April going forward.

3. Original Sept. 19, 2018 EPA Comment:

Appendix A –

> *a. The historical groundwater elevation measurement data table shows groundwater elevation values (fourth column) in feet, but the values prior to and after 2007 are presented in different units and thus not comparable. All values should be in the same units (feet NAVD88). Note that after being calculated, groundwater elevation values are independent of the top of casing or any other elevations and their changes, defined only by the datum. EPA recommends adding a column for Groundwater Elevation in feet NAVD88 to the table.*
>
> *b. Please explain the difference in adjustment of Reference Elevation (we assume it is Top of Casing Elevation) in 2007 between the Signetics Site wells and OOU wells. Two point seven zero three (2.703) feet were used for Signetics Site wells and twice of that, 5.406 feet, for OOU wells. Please revise the Report to provide an explanation of the origin of these values.*
>
> *c. Please explain the adjustment in Reference Elevation for well S078A done in 2002 (4.58 feet). There was no adjustment in 2002 for well S078B1. Groundwater contour in the A-zone in the vicinity of well S078A has a significant curve due to elevation at this well. Note that the groundwater elevation in the nearby B2-zone well COM036B2 (Figure 5), showing similar ~36 foot elevation, was discarded from B2 elevation contouring, creating an inconsistency. Please revise the Report to address these issues.*

Locus Response: Groundwater elevation measurement data tables will be revised to note the vertical datum, and the vertical datum will be consistent across all data points. Given the age of the wells at the site and the use of various datums over time including calculated datum conversions over the decades, the Signetics and OOU sites are currently undergoing a resurveying event by Licensed Land Surveyors. Surveyed reference elevations will be provided in the vertical datum NAVD88. These reference elevations will be implemented for use with annual depth-to-groundwater measurements for future annual reporting (tables and figures), beginning with the 2018 Annual Reports.

EPA Response: Response acceptable; however, the historic data presented in the 2018 Annual Report should be reconciled and internally consistent to allow for comparisons of groundwater levels through time.

Response: As promised, groundwater elevation measurement data tables will be revised to note the vertical datum, and the vertical datum will be consistent across all data points.

If you have any questions regarding this correspondence, please call me at (415) 799-9937.

Sincerely,

J. Wesley Hawthorne, PE, PG
President

JWH/njl

cc: (electronic copies)
Shau-Luen Barker, Philips Semiconductors
George Cook, Santa Clara Valley Water District
Lynne Kilpatrick, City of Sunnyvale, Department of Safety
Shantal Der Boghosian, Northrop Grumman Systems Corporation
Heather O'Cleirigh, AMD